Vol. VII, Jan. 1882, p. 59), is much less richly colored than the others, especially on the lower parts where the dark markings are but little obscured by chestnut save on the breast and the middle of the abdomen. This specimen, however, has one peculiarity not shared by any of the others; viz., a band or collar of broad, elongated, stiffened feathers which extend continuously around the neck in front crossing the lower portion of the jugulum about in a line with the neck tufts and forming a conspicuous ruff which is mainly black mixed with reddish chestnut.

All four of these singularly colored Grouse are males. As all of them were obtained in the markets, nothing positive is known as to the localities where they were killed. This is unfortunate for definite knowledge on this point is almost essential to any satisfactory explanation of their peculiarities. It seems probable, however, that they represent merely a color phase of *Tympanuchus americanus* (with which all but the bird last mentioned agree prefectly in every respect excepting color); or, in other words, that the Prairie Hen is subject to a form of what is known as erythrism. In any case the rufous plumage must be either of very rare or very local occurrence, for since obtaining my bird I have examined several thousand Prairie Hens in the Boston markets without finding a second specimen.

THE FULMARS OF SOUTHERN CALIFORNIA.[1]

BY A. W. ANTHONY.

SOME time about the last of September the first of the Fulmars make there appearance off the coast of southern California, the exact date being somewhat uncertain and due in a measure to the food supply, and quite possibly also to the weather.

The first arrivals are met with well off shore, with the flocks of Shearwaters, *Puffinus gavia*, *creatopus* and *griseus*, from ten to thirty miles at sea.

[1] An author's edition of 125 copies of this paper was issued March 16, 1895.— ED.

The first birds are usually, I think, in the dark phase of plumage. At any rate my records for the past four seasons show that birds in this plumage are the first to arrive, and the latest spring record,— April 12, San Martin Island, Lower California,— was that of a dark bird. My late spring observations, however, are too scanty to be at all satisfactory, and I should expect to find a few birds at least well off shore as late as April 20.

Ten miles west of Point Loma, at the entrance of San Diego Bay, is an extensive fishing bank extending parallel with the coast for a distance of several miles. This bank is resorted to during fair weather, from October 1 to March 1, by the San Diego fishermen who obtain large quantities of rock cod there for the markets of southern California. The fishing is all done in from seventy-five to one hundred fathoms of water. I think there is nowhere less than fifty fathoms. There are often large schools of small fish on the surface, which attract large numbers of sea birds, including the Fulmars, and it is along this bank that Fulmars are to be found if anywhere near shore. They are hardly what one would call gregarious, although several are often seen in company flying along in a loose, straggling flock. More often they are seen in flocks of *Puffinus gavia*, one or two in a flock of fifty Shearwaters.

Unlike the Shearwaters, however, they seldom pass a craft without turning aside to at least make a circuit about it before flying on. If the vessel is a fishing sloop sounding on the banks, the chances are in favor of the Shearwaters being forgotten and allowed to disappear in the distance while the Fulmar settles lightly down on the water within a few yards of the fisherman. The next Fulmar that passes will, after having made the regulation circuit, join the first until within a few minutes a flock of six or eight of these most graceful and handsome Petrels have collected, dancing about on the waves as light and buoyant as corks. As the lines are hauled up after a successful sound, the long string of often twenty to thirty golden-red fish are seen through the limpid water while still several fathoms in depth, and great excitement prevails. Any Fulmars that have grown uneasy and have started out on the periodical circuit of

the craft immediately alight a few yards to the windward. Those that are on the water and have drifted away hasten to the spot with wings outspread and feet pattering along on the water.

It is more than likely that in hauling up the net one or more fish become detached from the hooks; such fish, if loosened after having been raised twenty fathoms, are sure to rise to the surface a few feet to the windward of the boat. The pressure of the water being suddenly removed, the internal pressure becomes so great that the fish is greatly distended and rises helpless to the surface.

With a hoarse croak and wings outspread the nearest Fulmar pounces upon the unfortunate cod, keeping all others at bay with threatening beak. A few hasty snaps at the eyes or air bladder protruding from the mouth convinces him that codfish are tough, and the first floater, if a large one, is abandoned for the moment, for the second, should there be more than one, or for a snap at the bait on the hooks.

Their excitement by this time has attracted the attention of several Western and American Herring Gulls which hover screaming over the sloop, too shy to attempt to touch the fish while it is so near. Another ocean wanderer meantime has arrived; a Short-tailed Albatross, sweeping along, has noticed the commotion among his lesser brethren, and with a groaning note settles down by the floating fish, keeping all trespassers away by a loud clattering of mandibles; though not infrequently a Fulmar will dispute possession for some time with an Albatross before leaving a fish he has torn open, and I think a Fulmar will usually rout a Western Gull entirely.

In attacking a fish under the above conditions the eyes and air bladder are first eaten, after which the abdomen is torn open, if possible, and the entire contents of the skin torn out piecemeal. I have, however, seen birds seated on the water by the side of fish from which they had eaten the eyes, but were unable to tear open the tough skin.

The bait on fish hooks left hanging over the sides of the boat is often taken within a few feet of the fisherman, and birds are not infrequently hooked, much to the disgust of both the fisherman and the bird. Their confidence in mankind is at all times very

great. I have several times seen them killed by Portugese fishermen who had but to drop a small piece of fish overboard and hit the bird with a club when it swam up to get it.

I was one day becalmed in a small schooner several miles off shore when several Fulmars settled near us after the usual sweep about our vessel. I had a fresh bonito on deck which I began to cut up and toss over to them. The fish was too heavy to float, sinking quite readily, and no attention was paid to a piece that had sunken over eighteen inches, and even those that had reached that depth were not always secured.

In diving they used both feet and wings, the latter only half open, the primaries seeming to be used very little, if any, but kept drawn back with the secondaries. Once under the water they make good headway, seizing the fish, which is swallowed immediately upon reaching the surface.

By lying flat upon the rail of the schooner I could just reach the water with my finger tips when the waves favored me, but even at this disadvantage it was only a few moments till I had captured several Fulmars by coaxing them up with bits of fish and grabbing them when the roll of the vessel placed me near enough. When thrown upon deck they made no attempt to fly, but with outstretched wings hurried to the rail, over which they could just reach, and emptied the contents of their stomachs into the sea, a performance they attempted to repeat whenever they were disturbed. Their actions were so like those of sea-sick landsmen that it was extremely laughable. The popular belief among sailors is that they are really sea-sick, but of course the action is prompted by anything but nausea. It is more likely that the stomach contents are given up, as the Tern disgorges when pursued by a Jaeger, as a ransom.

When tossed overboard it was only a few minutes until the same birds were back again, as full of confidence as before, and one, to the foot of which I tied a piece of twine a yard long, followed the schooner nearly all day, often disappearing a mile or more ahead and returning again.

In catching Fulmars with my bare hands I found that it was quite safe to let go of them as soon as convenient, for they are provided with an unusually sharp bill, and are singularly willing to use it.

My brother once found a Pacific Fulmar in San Diego Bay, the only record, by the way, that I have of their entering the harbor. As he had no gun he gave chase in his skiff and captured it without injury. He said that at first it was rather wild but after flying a few times it gained confidence and only attempted to escape by swimming, when it was easily overtaken and caught. It was in no way injured or diseased so far as I could determine by dissection.

Although mention has been made of their following fishing sloops, fish form a very small part of their diet while on this coast. In fact it is the exception. I have never found small fish in the stomachs of those I have taken, nor have I seen them catch fish for themselves, though I have no doubt regarding their ability to do so should they fall in with a school of small herring or anchovies, and from their associating with the flocks of Shearwaters I infer that they derive a part of their food from such schools of small fry when they are common. There is, however, a large jelly fish (*Medusa ?*) that is usually abundant along this coast during the time of the Fulmars' sojourn, and these are never disregarded by the ever hungry birds. I have often seen a Fulmar sitting on the water by the side of a jelly fish, part of which it had eaten, so filled that it would scarcely move out of the way of the boat. Specimens shot while these *Medusæ* are common I have always found with the stomach filled with these alone, and half a pint of the slimy mass will often run from their mouths when lifted from the water by their feet.

I think the Fulmars enjoy a monopoly of this diet, for I have never seen other species eating it, nor will Gulls, nor any of the sea birds that I have observed, pay any attention to a Fulmar that is eating a jelly fish though they all claim their share if the food is of a kind that they care for.

The abundance of the Fulmars off this coast would seem to have some relation to the abundance of the *Medusæ*, since the winter of 1893–94 was noted for the almost if not entire absence of Fulmars as well as jelly fish until some time in late February or March when both jelly fish and Fulmars appeared in small numbers.

I have occasionally seen Fulmars busily engaged in picking small crustacea (?) from the kelp, but as a rule they prefer to

obtain their food in open water where they are much oftener seen than along the immense beds of kelp (*Macrocystis pyrifera*) and 'bull kelp' (*Nerecystis lutkeana*) that fringe the shores for miles along the southern coast. These kelp beds, however, acting as barriers to drifting *Medusæ*, often entangle a quantity of them, and for the time being Fulmars are common near shore. They will also follow the Shearwaters which at times drive schools of small fish into the kelp beds. In diving for fish in competition with Shearwaters they are badly handicapped; their plumage being much less compact makes it not only more difficult for them to get under the water but they cannot dive so far nor swim so fast below the surface as can the Shearwaters.

In flight the Fulmars much more closely resemble the Shearwaters than the Albatross, though they have the habit common to all of these families of sailing along over the water at an angle of about 45° with the tip of the lower wing but just above the waves. The wing beats are rapid, about as in *Puffinus*, and there is at a distance little to distinguish the Fulmars in the dark phase from *Puffinus griseus*, except the shorter, less pointed wings and heavier body of *Fulmarus*.

In rising from the water the Fulmars, Shearwaters and both species of Albatross found with us (*Diomedea albatrus* and *D. nigriceps*) spread the wings and run along the water for a distance to gain sufficient momentum to lift them clear of the waves. The Fulmars will almost invariably, according to my observations, rise toward an approaching boat, while both *Puffinus* and *Diomedea* always fly from anything disturbing them and rise preferably against the wind.

Before discussing the relative abundance of the races, I think best, in order to have names for all of them, to describe a race which I believe to be heretofore unrecognized and as well entitled to separation as is *minor* of the Atlantic. For this race I propose the name of

Fulmarus glacialis columba, subsp. nov. PIGEON FULMAR.

Subsp. char. — Differing from *glupischa* in much smaller size, equalling *minor*, from which it differs in differently colored bill and in the dark phase being much darker.

Type (light phase), No. 4914, Coll. A. W. A. Off San Diego, California, Feb. 21, 1894. General plumage white. Mantle pearly gray, rather darker than light phase of *glupischa* in my collection. Tertials white with brownish gray clouding.

Dark Phase. Type No. 5596, Coll. A. W. A. Off San Diego, California, Oct. 16, 1894. Uniform deep sooty plumbeous. Bill yellow. Iris brown.

The proposed race differs from *minor* exactly as does *glupischa* from *glacialis*. The plumage and color of the bill are practically as in *glupischa*, from which it differs, as above stated, in smaller size, as will be shown in the following tables.

Unfortunately I have mislaid the measurements of a part of my series, which is now inaccessible, but the results as given in the tables below would not be materially changed by the addition of measurements of the series I have examined.

I have but a single skin of *glacialis* to use in comparison. This is an adult in light plumage from Melville Bay. As compared with my skins of *glupischa* taken off this coast the mantle is a rather darker gray. This, however, is doubtless but an individual variation. The bill is noticeably smaller than in Pacific specimens I have seen, the nasal tubes being fully 4 mm. shorter than in Pacific Fulmars of otherwise the same general measurements. As I can find no mention by various writers of this apparent difference in the size of the bills I am forced to believe that there is considerable variation, though the measurements of *glupischa* before me are reasonably constant.

A specimen of *rodgersii* (No. 4913, Coll. A. W. A., Feb. 17, 1894, off San Diego, California) has the primaries slaty, the inner web with a sharply defined white wedge reaching to within 45 mm. of the end of the first primary and leaving a dark shaft line 5 mm. wide. The dusky on the tips of the primaries gradually becomes less and disappears at the ninth. The slaty shaft line becomes also narrower and disappears on the sixth.

In a younger specimen shot the same day the wedge is very poorly defined and much less purely white (grayish). The mantle is much more continuously gray and the tail from above dusky gray. In the adult the tail is pure white with a dusky terminal bar of 12–15 mm.; central rectrices with but a slight clouding of dusky at the end.

In the light phase the three races, *glupischa*, *rodgersii* and *columba*, seem to be nearly equally abundant. The dark birds, which form, I think, about 65 per cent of the whole, swell the ranks of *glupischa* and *columba* considerably. If *rodgersii* has a dark phase it is indistinguishable from that of *glupischa*.

Fulmarus glacialis glupischa (White Phase).

No.	*Locality.*	*Date.*	*Sex and Age.*	*Total Length.*	*Wing.*	*Tail.*	*Chord of Culmen.*	*Nasal Tubes.*[1]	*Tarsus.*
				mm.	mm.	mm.	mm.	mm.	mm.
92908[2]	Bering Island,	Feb. 7, '83	♂ ad.	471	320	117	36		52
92909[2]	Copper Island,	Jnly 14, '83	♀ ad.	458	328	122	36		51
5871	Off San Diego, Cal.,	Feb. 21, '94	♂ ad.		321	140	40	14	50
5872	" " "	Feb. 21, '94	♂ ad.		322	145	39	14.5	53

Dark Phase.

89138[2]	Copper Island,	June 8, '82	♀ ad.	425	312	120	35		
92910[2]	Bering Island,	May 4, '83			330	132	36		50
92911[2]	Copper Island,	July 5, '83	♂ ad.	480	333	131	37		51

F. glacialis rodgersii.

4912	Off San Diego, Cal.,	Feb. 21, '94	? ad.		312.5	138.5	40	14	50
4913	" " "	Feb. 21, '94	♂ ad.		332.5	143	39	12	50

F. glacialis (White Phase).

4810	Melville Bay,	July 17, '91	♀ ad.		324	128	34	10	46

F. glacialis columba.

4509	Off San Diego, Cal.,	Oct. 12, '93	♀ ad.		293	124	33	15	45	White
4914	" " "	Feb. 21, '94	♀ ad.		283	125	36	15	46	"
5595	" " "	Oct. 16, '94	♀ ad.		280	137	36	14	48	Dark
	" " "	Oct. 16, '94	♀ ad.		305	140	38	13.5	48.5	"
5596	" " "	Oct. 16, '94	♀ ad.		296	131	34.5	12	43	"
	" " "	Oct. 16, '94	♀		305	138	38	14	47	"

[1] The measurements of nasal tubes are from the base of the culmen to the border of the concave outline of the tubes or the shortest measurements taken along the culmen.

[2] Catalogue U. S. Nat. Museum, the other numbers being those from my own collection.

Dr. Stejneger says of the two phases of *glupischa* on the Commander Islands (Bull. 29, U. S. Nat. Mus.): "The young birds of the white forms have the head and greater part of the lower surface suffused with light gray, yet they can never be mistaken for the dark ones, and I doubt very much if any intergradation *between the fully matured adults* of the two forms or phases can be proven. I have observed thousands and tens of thousands of the dark forms breeding, not finding a single one perceptibly lighter, although a small colony of the white form was breeding in the neighborhood but separate from the dark ones, nor were any of the light phase perceptibly darker than usual, and in no case were white and dark birds paired together."

There are periods when nearly all of the Fulmars found off this coast are of the same phase, but at times, when both light and dark birds are found, they are much more apt to separate than to flock together. If a flock of six or eight are seen, and I have seldom seen more than that together, they are usually all of one phase. The young of the light birds are easily distinguished at a distance, the plumage being much lighter than the dark plumage of *glupischa* or *columba*, but the young of the dark phase are in no way distinguishable from the adults by their plumage. A fully adult *columba* in the dark plumage, taken Oct. 16, shows a mottled condition caused by the lighter tips of the old feathers scattered through the fresh plumage. Several of my specimens have parts of the nasal plate loose and in a condition to be easily removed, suggesting that possibly these plates are to some extent deciduous. The material is not sufficient, however, to make it safe to venture an opinion. From the series of birds in the light phase I am of the opinion that three years at least must elapse before they reach the perfect adult plumage. The young of the first year are easily distinguished even at a distance, but those which I take to be two years old are not so easily separated. The mantle, however, is slightly darker, and the wedge on the inner webs of the primaries is grayish instead of pure white as in the adult, and its outline is not so sharply defined. The tertials are grayish-white in the young birds of two years and pure white in the adults. Dr. Stejneger (Bull. 29, U. S. Nat. Mus.) gives the color of the bill of a winter specimen of *glupischa*, taken off Bering Island, as yellow

with tinges of greenish and orange-brownish. The specimens which I have taken off San Diego have all had more purely yellow bills than the plate given by Dr. Stejneger. Dark lines follow the separations of the lamellæ and a dusky spot in front of the nasal tubes reaches at times to the base of the unguis. At the angle of the lower mandible is usually (always?) an orange spot, its outlines blended with the yellowish of the rest of the bill.

The claim of *F. glacialoides* to a place in the fauna of North America rests, I think, solely upon the type said to have been taken off the Columbia River. If the specimen came from there, as reported, the bird must be regarded as a very rare or accidental visitor to our coast, for none of the later observers have met with the species.

DESCRIPTION OF A NEW *PIPILO* FROM SOUTHERN AND LOWER CALIFORNIA.

BY A. W. ANTHONY.

A SERIES of brown Towhees collected the past year between San Diego and San Fernando, Lower California, differs so considerably from skins in my collection from the northern part of the habitat of *Pipilo fuscus crissalis*, that in order to ascertain the proper status of the southern bird, I have brought together a series representing nearly every considerable part of the habitat of the subspecies, reaching from Mendocino County, California, to Point San Carlos, Lower California, or from about latitude 40° to about 29° 30′. The number of skins examined is about 200, and the results obtained were more interesting than at first anticipated. Vigors's type of *P. f. crissalis* was obtained at Monterey. Unfortunately I am unable to secure a series from that exact locality, but Mr. R. C. McGregor has kindly sent me some skins from there that are in all respects indistinguishable from a fine series from Marin County, collected for me by Messrs. J. and